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## **Abstracts**

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# Conflict between Nomadic Herders and Brown Bears in the Byang thang Region of Tibet<sup>1</sup>

Dawa Tsering  
Tibet Academy of Social Sciences

John D. Farrington  
WWF-China

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**Abstract:** *In order to evaluate the impact of recently introduced wildlife conservation policies, a human-wildlife conflict survey of three-hundred herding households was conducted in the south-central Byang thang (Qiangtang) area of the Tibet Autonomous Region (bod rang skyongs ljongs, Xizang Zizhi Qu). Results showed that Tibetan brown bears were the largest source of human-wildlife conflict in the survey area, affecting 49 percent of surveyed households between 1990 and 2006, with a 4.5-fold increase in conflict with bears occurring since implementation of various wildlife protection policies beginning in 1993. Types of bear conflict included livestock kills, raiding of human food supplies, damage to dwellings and furnishings, and direct attacks on herders. Brown bears have caused devastating economic losses to herders and anecdotal evidence indicates that retaliatory killing of bears by herders now poses the greatest threat to the Tibetan brown bear. Immediate measures must be taken to resolve this conflict if humans and brown bears are to coexist in the Byang thang region.*

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<sup>1</sup> Acknowledgments: support for this research was provided by The Bridge Fund, WWF-US, the Tibet Forestry Bureau, the Ngari Prefecture Forestry Bureau, the Nakchu Prefecture Forestry Bureau, and all of the county level governments and forestry bureaus within the Byang thang and Ziling Lake National Nature Reserves. All photos were taken by and used courtesy of the Nyima, Tsonyi, and Shentsa County Forestry Bureaus. The authors would like to thank the following people for their invaluable advice and contributions towards the completion of this project: Ms. Droma Yangzom, Mr. Wei Dong, Mr. Dawa Pakdro, Mr. Tsewang Norbu, Mr. Gelek, Mr. Nyima Pongstok, Mr. Zome, Mr. Danda, Dr. George B. Schaller, Dr. Melvyn C. Goldstein, and especially Mr. Kelsang Norbu, Ms. Nyima Chudron, and Mr. Purpo Wangdai for their help with data collection in the field. We also express our deepest gratitude to all the interviewees and governments of the seven townships from Nyima, Tsonyi, and Shentsa County where this research was conducted.

## Introduction

The Tibetan brown bear (*Ursus arctos pruinosus*), also known as the “Tibetan blue bear” or “horse bear,” is a close cousin of the American grizzly bear (*Ursus arctos horribilis*), and one of many subspecies of *Ursus arctos* found in the northern hemisphere (Photo 1). Four other notable subspecies of brown bears include the European brown bear (*Ursus arctos arctos*), the Himalayan brown bear (*Ursus arctos isabellinus*), the Kodiak bear (*Ursus arctos middendorffi*), and the Hokkaido brown bear (*Ursus arctos yesoensis*), however, researchers are not in complete agreement concerning the number of subspecies of brown bear that exist today. Of the major subspecies of *Ursus arctos*, the Tibetan brown bear is by far the least known and least studied due to the remote nature of its range and the rapid decline of its population over the past century.



Photo 1. A Tibetan brown bear (*Ursus arctos pruinosus*).

At present, knowledge as basic as the Tibetan brown bear's exact geographic distribution, home range size, and estimated total population are largely matters of conjecture. However, the Tibetan brown bear occurs north of the Himalaya (*he ma la ya*, *Ximalaya*) and is found throughout most of the Tibetan Plateau (*mtsho bod sa mtho*, *Qingzang Gaoyuan*). A steppe-dwelling bear,

until the latter half of the twentieth century the Tibetan brown bear was quite common on the open meadows of the Tibetan Plateau but is now largely confined to mountainous terrain, having been widely hunted over the past century.<sup>2</sup> The Tibetan brown bear is now listed as “endangered” in the *China Red Data Book of Endangered Animals*, with the population of these bears in China's (*krung go*, *Zhongguo*) vast Tibet Autonomous Region (*bod rang skyongs ljongs*, *Xizang Zizhi Qu*; hereafter, TAR) estimated to be only 2,800 in 1998, and hunting of this species is nominally prohibited in China.<sup>3</sup> In addition, these bears are currently listed in Appendix I of the Convention on International Trade in Endangered Species (CITES), ratified by China in 1981, which includes all species that are threatened with extinction, trade of which is banned under the convention.<sup>4</sup>

Traditionally, the Tibetan brown bear has subsisted primarily by hunting the ubiquitous black-lipped pika (*Ochotona curzoniae*), with fecal analysis of bear

<sup>2</sup> George B. Schaller, *Wildlife of the Tibetan Steppe* (Chicago: University of Chicago Press, 1998), 192.

<sup>3</sup> Su Wang, *China Red Data Book of Endangered Animals* (Beijing: Science Press, 1998).

<sup>4</sup> United Nations Environment Program, *Convention on International Trade in Endangered Species - Appendices I, II, and III* (Geneva: United Nations, 2006), <http://www.cites.org/eng/app/appendices.pdf> (accessed December 18, 2007); United Nations Environment Program, *How CITES Works* (Geneva: United Nations, 2006), <http://www.cites.org/eng/disc/how.shtml> (accessed December 18, 2007).

droppings in the mid-1990s showing that pikas comprised 59 percent of droppings sampled, while the presumably scavenged meat of wild ungulates comprised 13 percent of droppings and grass and roots accounted for 26 percent of dropping content.<sup>5</sup>

Threats to the Tibetan brown bear have been largely limited to hunting by humans, and these bears have long been a prime target of local nomadic herders, who historically hunted them to protect their livestock or simply out of fear. However, the demise of Tibet's (*bod*, *Xizang*) brown bear population accelerated in the 1960s and continued through the 1980s when government workers and soldiers in the region widely hunted bears, at first for sport and later for gallbladder and bear paws that were sold in larger towns. Although capture of live bears for China's bear bile farms began in 1984 and continues to this day, as of 1996 of 7,642 bears kept on bear-bile farms in China, 7,370 were Asiatic black bears (*Selenarctos thibetanus*) while only 263 were various subspecies of brown bear.<sup>6</sup> Consequently, live capture of Tibetan brown bears for bear-bile farms is not seen as a major threat to the continued existence of Tibet's brown bears.

The focus of this research effort was on conflict between Tibetan brown bears and nomadic livestock herders in the south-central Byang thang (*Qiangtang*) region of the TAR (Map 1). The Byang thang is a barren region of sparsely populated, high altitude steppe grasslands that cover roughly the northern half of the TAR and extend into western Qinghai Province (*mtsho sngon zhing chen*, *Qinghai Sheng*). Known locally as the "great northern void," the rolling expanses of the northern TAR's Byang thang region have an average elevation of about 4,500 meters and form one of the most remote and inhospitable places on earth. Yet, in spite of the harsh high-altitude climate and scant forage, the region harbors a unique assemblage of large fauna, including Tibetan antelope, Tibetan gazelle, Tibetan wild ass, wild yak, blue sheep, argali, snow leopard, wolf, lynx, fox, and the Tibetan brown bear.

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<sup>5</sup> Schaller, *Wildlife of the Tibetan Steppe*, 195.

<sup>6</sup> Zhiyong Fan, "Bears Present Status and Conservation, and Bear Farms of China," in *Proceedings of the Second International Symposium on the Trade of Bear Parts*, ed. Douglas F. Williamson and Andrea L. Gaski (Washington, D.C.: TRAFFIC-USA, 1997), 5-19.



Map 1. Location of the Jangtang National Nature Reserve (byang thang rgyal khab rim pa'i rang byung srung skyob khul, Qiangtang Ziran Baohu Qu) and Ziling Lake National Nature Reserve (zi ling mtsho rgyal khab rim pa'i rang byung srung skyob khul, Selin Hu Ziran Baohu Qu) in China's TAR.

Remarkably, this region was never permanently inhabited until the latter half of the twentieth century, and up until that time vast herds of wild ungulates roamed the Byang thang's grasslands as well as large numbers of large predators.<sup>7</sup> However, since the mid 1950s, the construction of roads across the northern TAR has led to increased access to the Byang thang region, and a large influx of nomadic livestock herders to previously uninhabited areas of the Byang thang. While small numbers of nomads have roamed the northern Byang thang's vast steppes with their herds seasonally for centuries, since the 1960s, as a result of increasing population pressure and government policies to increase livestock production, the population of the TAR's Byang thang region has grown rapidly, tripling in some areas, as large numbers of nomadic herders from throughout the Tibetan cultural area (*bod pa'i rig gnas khyab khongs*, *Zangzu wenhua quyü*) have migrated to the Byang thang region with their herds, settling previously uninhabited lands and constructing the region's first permanent settlements.<sup>8</sup>

The growing number of herders occupying previously uninhabited areas has, not surprisingly, led to increasingly frequent occurrences of human-wildlife conflict. However, while in the past the herders' economic losses were kept to a minimum by the hunting and trapping of problem wildlife, these activities were banned in much of the northern TAR with creation of the 298,000-square-kilometer Jangtang

<sup>7</sup> Schaller, *Wildlife of the Tibetan Steppe*, 284, 290-93.

<sup>8</sup> Joseph L. Fox and Dawa Tsering, "Biodiversity Conservation and Natural Resource Exploitation on Tibet's Northwest Chang Tang Highlands," in *Wildlife and Plants in Traditional and Modern Tibet: Conceptions, Exploitation, and Conversation*, ed. A. Boesi and F. Cardi. Memorie della Societa Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano 33, Fascicolo 1 (Milano: Memorie della Societa Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano, 2005), 49-57; Schaller, *Wildlife of the Tibetan Steppe*, 290-293.

and the 18,936-square-kilometer Ziling Lake Nature Reserves in 1993 (Map 1).<sup>9</sup> Killing of wildlife in the region was further restricted by the 2001 weapons confiscation program carried out in these reserves, and by the more stringent enforcement of regional wildlife protection laws since these two reserves were elevated from provincial to national level protected status in 2001. As a direct consequence of these wildlife conservation policies, the frequency of incidence of human-wildlife conflict and resulting economic losses to herders in Tibet's south-central Byang thang region have soared in the past five years. In the present study, conflict with Tibetan brown bears was found to be the single largest wildlife conflict problem for herders, with brown bears not only killing livestock but also raiding food supplies, severely damaging houses, tents, and home furnishings in the process, and even attacking, and on occasion killing, herders themselves. Consequently the clandestine retaliatory killing of Tibetan brown bears by nomads is now believed to be the single largest threat to the continued existence of these bears.

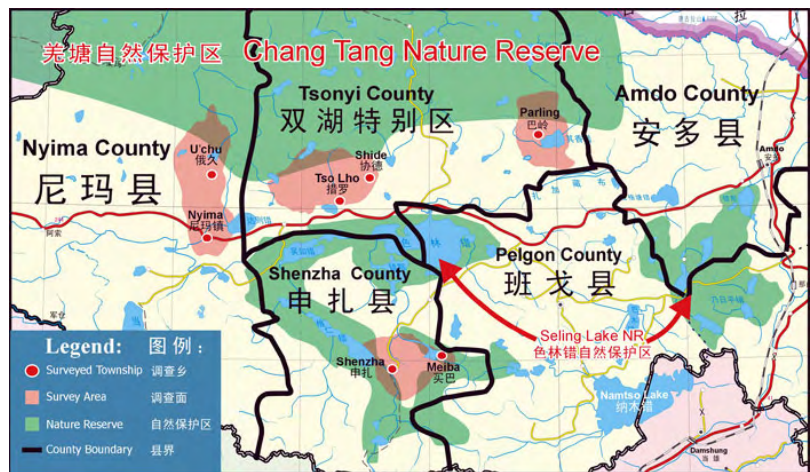
### The Human-Wildlife Conflict Survey Methodology

In order to evaluate the impact of new wildlife conservation policies and gain an understanding of how the growing problem of human-wildlife conflict is affecting herders and wildlife in the region of the Jangtang and Ziling Lake National Nature Reserves, in April of 2006 the WWF China-Lhasa Field Office (*'dzam gling khor yug thebs rsta tshogs pa'i lha sa rnam grangs gzhang don khang*, *Shjie Ziran Jijinhui Zhongguo-Lasa Tianye Xiangmu Ban*) conducted a survey of three-hundred herding households in the southern Byang thang's zone of high population concentration in Nakchu Prefecture's (*nag chu sa gnas*, *Naqu Diqu*) Shentsa County (*shen tshwa rdzong*, *Shenzha Xian*), Tsonyi County (*mtsho gnyis rdzong*, *Shuanghu Xian*), and Nyima County (*nyi ma rdzong*, *Nima Xian*) (Map 2). Of the nine counties that fall within the Jangtang and Ziling Lake National Nature Reserves, the above three counties were chosen for this survey for two primary reasons: 1) The authors have conservation projects ongoing in these three counties and the information obtained will be used in the later stages of these projects, and 2) road conditions in these three counties, though poor, are still much better than in the more remote areas of the reserves, which made it much easier to conduct the survey in a reasonable amount of time.

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<sup>9</sup> Tibet Forestry Bureau, *Chang Tang Blue Print* (Lhasa: Government of the Tibet Autonomous Region, 1999); Tibet Forestry Bureau, *Seling Lake Black-Necked Crane National Nature Reserve Master Plan (2003-2010)* (Lhasa: Government of the Tibet Autonomous Region, 2003).





Map 2. Location of townships surveyed for the April 2006 WWF ('dzam gling khor yug thebs rtsa, Shjie Ziran Jijinhui) Human-Wildlife Conflict Survey.

The survey did not intend to specifically target areas already known to have high incidence of human wildlife conflict, but sought to gain a broader view of this issue in the most heavily populated areas of the TAR's south-central Byang thang. In order to get a fairly random geographic sampling from these three counties, the names of all townships in each county were placed in a box, and two townships from each county were drawn in a lottery. The original intention had been to interview fifty residents in each township, however, when this proved logistically unfeasible a simple total of one-hundred residents were interviewed from two townships in both Shentsa and Nyima Counties, while a total of one-hundred residents were interviewed in three randomly selected townships in Tsongyi County (Table 2.1). The only criteria used when choosing individual households to interview was that all households had to be engaged in livestock herding as their primary occupation and their homes and camps had to be accessible by jeep. Interviewees were primarily heads of households, but also included other knowledgeable adult family members if the household head was absent. The survey team consisted of three ethnic Tibetan staff members from the WWF China-Lhasa Field Office, who were assisted at various times by local village leaders, officials from the respective county forestry bureaus, forestry bureau drivers, and herders who acted as guides for the research team.

Table 2.1. Number of Surveyed Households by County and Township

County	Township	Number of Surveyed Households	Percent of Total Surveyed
Nyi ma	Dngul chu	45	15.0
	Nyi ma	55	18.3

Shen tshwa	Shen tshwa	78	26.0
	Smad pa	22	7.3
Mtsho gnyis	Bar gling	51	17.0
	Zhi bde	19	6.3
	Mtsho lho	30	10.0
Total		300	100.0

The actual survey consisted of a four-page questionnaire with sections on:

- The surveyed household's economic status and mode of living;
- The nature of wildlife conflict experienced, if any;
- Herders' opinions on the causes of and solutions to wildlife conflict;
- Herder's knowledge of wildlife conservation issues;
- The distributions of the endangered Tibetan brown bear and snow leopard in the areas visited.

It should be noted that nomadic herders formerly accustomed to supplementing their incomes and preventing wildlife conflict by hunting and trapping wildlife often grossly inflate the threat both wild predators and ungulates pose to their livelihoods, particularly when talking to wildlife researchers. However, herders who spend long hours out on the land in remote areas each day are also one of the best sources of information about wildlife populations in these areas. Thus while a herder's response to a given survey question may be exaggerated in hopes that the survey results will contribute to reversing policies banning hunting of wildlife, it is nevertheless felt that the general pattern of human-wildlife conflict that emerged from this survey is accurate, and that resolving this conflict is of utmost importance if the extinction of Tibet's brown bears and other steppe dwelling large fauna is to be prevented.

## **Socio-Economic Status of Surveyed Herding Households**

In order to learn about the mode of living of surveyed herders and to see if there is any correlation between socio-economic factors and the frequency of incidence of human-wildlife conflict, herders were asked about the type of residence they inhabited; their living arrangement, either as individual families or groups; and their self-assessed economic status, which was based largely on a family's livestock holdings.

### ***Residence Type***

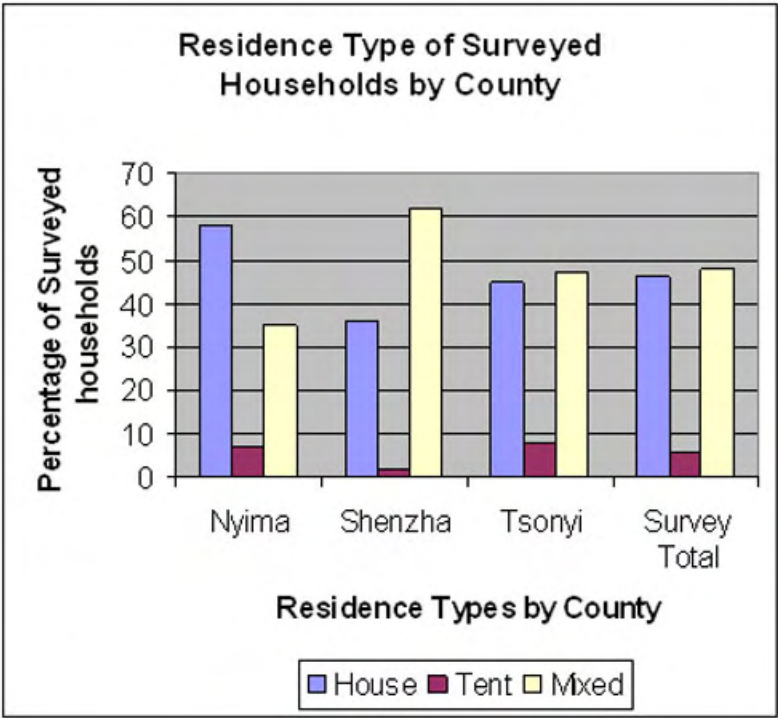
The survey revealed three basic residence types in the survey area, families that live year-round in permanent houses, families that live year-round in tents, and families with a mixed lifestyle that reside for parts of each year in both houses and tents (Table 3.1, Figure 3.1).

In total, 46 percent of surveyed herding households lived year round in permanent houses. In the Byang thang region, permanent homes are a relatively new phenomena, only having been widely adopted by herders since the 1970s when the introduction of roads and vehicles in the Byang thang made simple building materials widely available in the markets of local townships.

**Table 3.1. Residence Type of Surveyed Households by County**

Residence Type	County			Totals	
	Nyi ma	Shen tshwa	Mtsho gnyis	Total Number by Residence Type	Percent of Total Surveyed
House	58	36	45	139	46
Tent	7	2	8	17	6
Mixed	35	62	47	144	48
Total by County	100	100	100	300	100

*Note: Because one-hundred households were surveyed in each county, county figures also represent percentages for individual counties.*



*Figure 3.1. Residence type of surveyed households by county.*

These homes are typically single room mud-brick huts with roofs made from wooden beams sealed with plastic tarps that are held down by a layer of dry mud.

Better-off families were seen to have up to four-room mud-brick houses. While some families live year round in the same house, others have constructed two such houses at both their summer and winter camps.

A slightly more common mode of residence was that of the mixed residence of 48 percent of surveyed households. These families typically constructed permanent mud-brick huts at their winter camps and lived in tents at their summer camps, although some larger families also erected tents next to their permanent homes to house family members. Of only minor importance were families that lived year round in tents, which comprised 6 percent of survey respondents (Photo 2). These were typically poorer families, the poorest of which resided in home-made tents sewn from cotton canvas purchased in the market, while better off tent dwellers resided in the traditional black yak-hair tents commonly found throughout much of the Tibetan cultural area.

Living Arrangement

In terms of social organization, herders were categorized by their living arrangement simply as either individual families living alone or multiple families residing together as groups (Table 3.2, Figure 3.2).



Photo 2. Traditional yak-hair tent used by nomadic herders in Tibet.

Apart from a few areas of the southern Byang thang with relatively milder climates and more productive pastures, where herders reside year round in the same place, the vast majority of the Byang thang’s herders move seasonally between summer and winter pastures. A large percentage of surveyed herders, 32 percent, do so as individual families, often living at great distances from the nearest neighbors or township. But most herders surveyed, 68 percent, were found to have formed group living arrangements.

Table 3.2. Living Arrangement of Surveyed Households by County

Living Arrangement	County			Totals	
	Nyi ma	Shen tshwa	Mtsho gnyis	Total Number by Living Arrangement	Percent of Total Surveyed
Group	65	88	51	204	68
Individual	35	12	49	96	32
Total by County	100	100	100	300	100

Note: Because one-hundred households were surveyed in each county, county figures also represent percentages for individual counties.

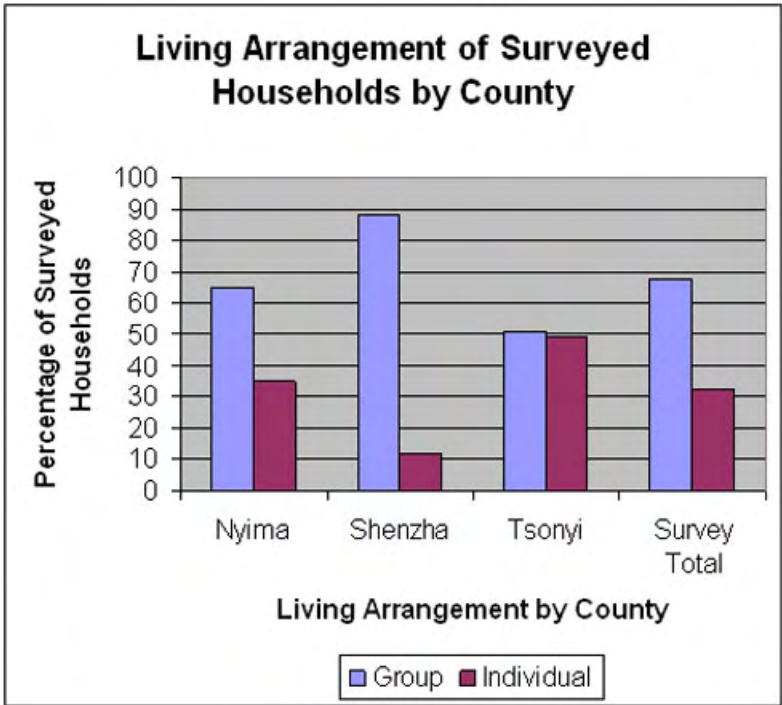


Figure 3.2. Living arrangement of surveyed households by county.

Herding groups in rural areas typically consisted of two families living side by side, less often three families living together, which facilitates division of labor and provides some degree of safety in the event of an emergency. However, in winter, many herders surveyed returned to dwell in township seats, typically small villages consisting of 30 households, which provided easy access to social services, such as schools and medical clinics, as well as providing easy access to dealers and markets for livestock products. Thus only surveyed families living by themselves year-round without returning to the township in winter were counted as “individual” families in this survey.

***Self-Assessed Economic Status***

In terms of self-assessed economic status, which in herding economies is largely a function of herd size, herders were asked to categorize themselves simply as being poor, middle class, or rich (Table 3.3, Figure 3.3).

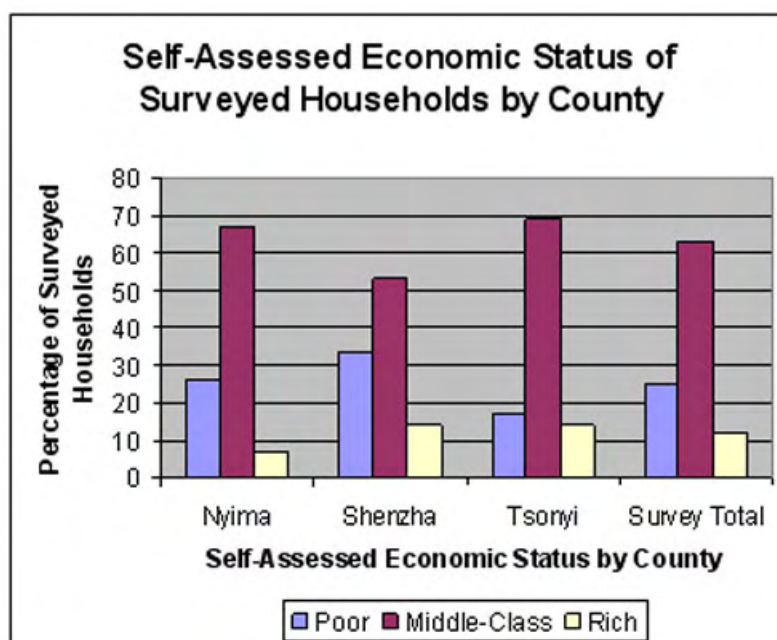
In this survey, the vast majority of respondents, 63 percent, considered themselves to be middle class, while 25 percent considered themselves to be poor and 12 percent categorized themselves as rich. Tabulation of livestock holdings among the surveyed herding households revealed combined sheep and goat holdings to be the livestock types of greatest economic importance. While yaks only appear to be of secondary economic importance in the survey area, they are culturally

important as the source of wool for tents, ropes, and clothes; for meat; and for butter for making tea and burning in lamps.

**Table 3.3. Self-Assessed Economic Status of Surveyed Households by County**

Self-Assessed Economic Status	County			Totals	
	Nyi ma	Shen tshwa	Mtsho gnyis	Total Number by Economic Status	Percent of Total Surveyed
Poor	26	33	17	76	25
Middle-Class	67	53	69	189	63
Rich	7	14	14	35	12
Total by County	100	100	100	300	100

*Note: Because one-hundred households were surveyed in each county, county figures also represent percentages for individual counties.*



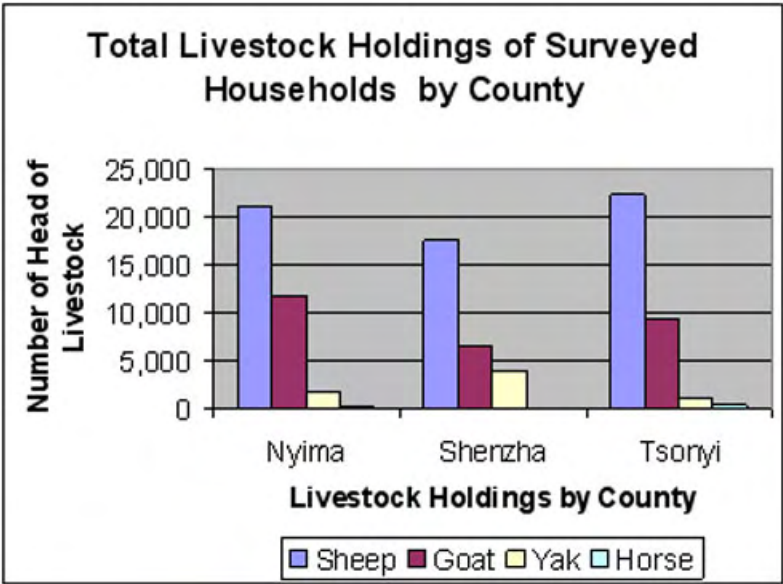
*Figure 3.3. Self-assessed economic status of surveyed households by county.*

Somewhat surprisingly given the large numbers of livestock to be herded and the remoteness of the terrain, surveyed households owned very few horses, with only seven households owning more than ten horses, while ninety-one households, or 30 percent of those surveyed, owned none at all, either herding their livestock on foot or having replaced horses for work and transportation with motorcycles and jeeps (Table 3.4, Figures 3.4). None of the households surveyed owned cows, as these are difficult to raise in the cold arid Byang thang climate with its extremely

thin cover of short grasses that are not suitable for haying for supplemental winter fodder.

**Table 3.4. Total Livestock Holdings of Surveyed Households by County**

Livestock Type	County			Livestock Totals by Type
	Nyi ma	Shen tshwa	Mtsho gnyis	
Sheep	21,217	17,547	22,364	61,128
Goat	11,759	6,541	9,354	27,654
Yak	1,771	3,928	1,091	6,790
Horse	231	144	340	715
Total Head by County	34,978	28,160	33,149	96,287



*Figure 3.4. Total livestock holdings of surveyed households by county.*

While there is a minimum number of head of livestock per household member that is needed to sustain a “middle-class” herding lifestyle and provide insurance against large losses in the event of natural disasters, such as exceptionally severe winters, this figure is highly variable. Such factors affecting this figure include productivity of a herding family’s pasture lands, severity of climate, type of livestock owned and quantity of each type, distance to markets, and alternative sources of income to herding. Thus, the actual number of livestock held by a household in any of the three economic categories was highly variable, as Table 3.5 below shows.

**Table 3.5. Ranges of Livestock Holdings of Surveyed Households by Self-Assessed Economic Status**

Self-Assessed Household Economic Status	Livestock Type		
	Sheep and Goats Combined	Yak	Horse
Poor	0-1200	0-120	0-6
Middle-Class	32-900	0-102	0-20
Rich	90-1550	0-138	0-15

However, the number of family members in surveyed households ranged from one to twenty-one people, and when household livestock holdings were calculated on a per person basis a distinct class stratification based on livestock holdings emerged (Table 3.6, Figure 3.6).

**Table 3.6. Average Livestock Holdings Per Household Member of Surveyed Households by Self-Assessed Economic Status**

Self-Assessed Household Economic Status	Livestock Type				
	Sheep	Goat	Sheep and Goats Combined	Yak	Horse
Poor	15	9	24	1	0
Middle-Class	37	18	55	3	0
Rich	58	23	81	6	1



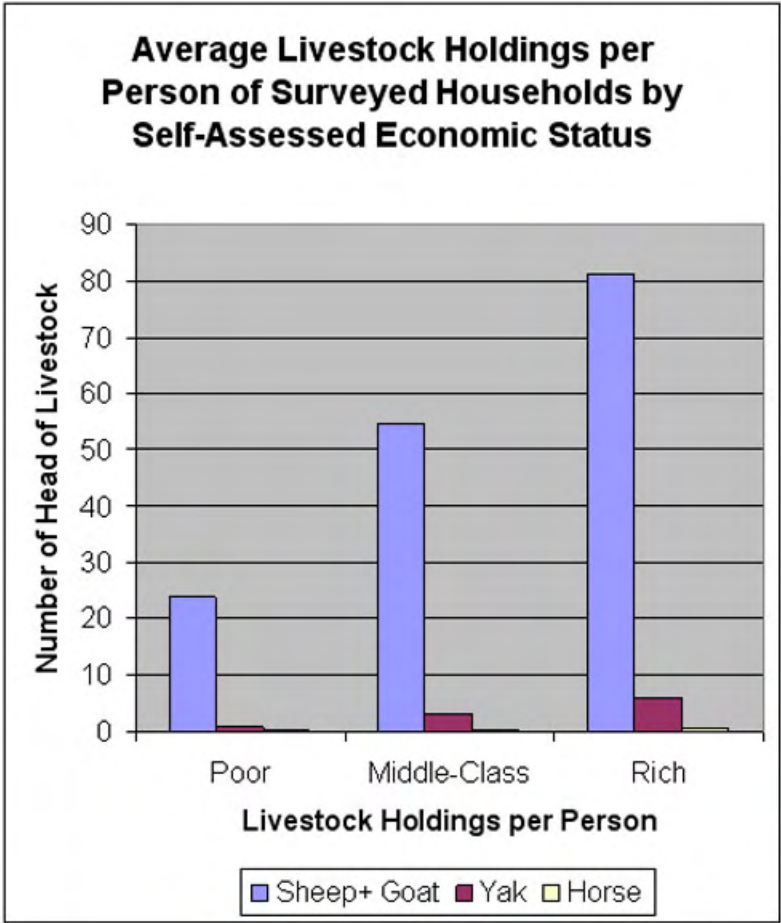


Figure 3.6. Average livestock holdings per person of surveyed households by self-assessed economic status.

## Analysis of Human-Wildlife Conflict

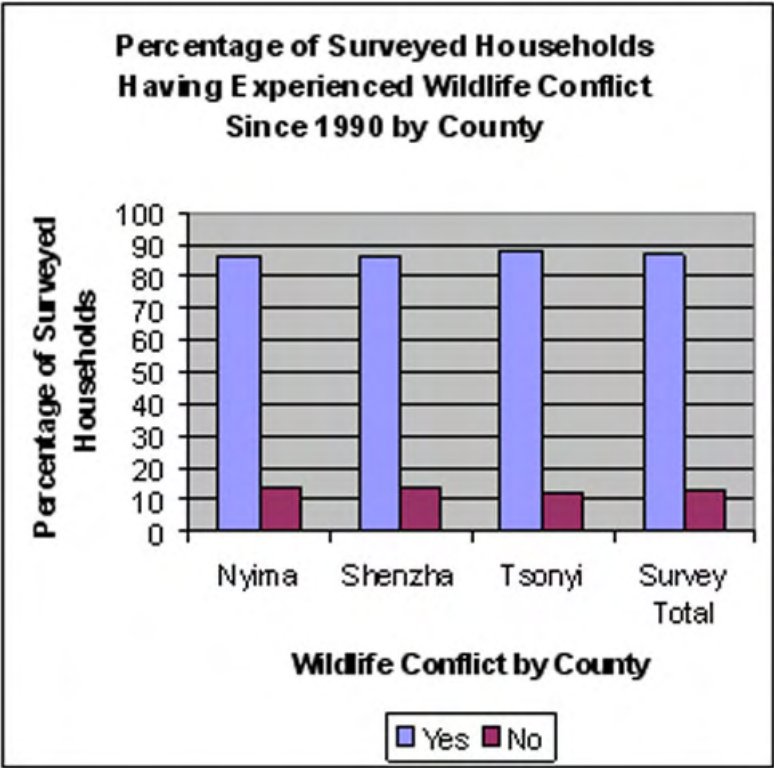
### *Overall Human-Wildlife Conflict*

In total, 87 percent of all surveyed households reported experiencing conflict with wild predators and/or ungulates at least once since 1990, clearly illustrating just how pervasive the problem of human-wildlife conflict is in the southern Byang thang Region (Table 4.1, Figure 4.1).

**Table 4.1. Number of Surveyed Households Reporting Having Experienced Wildlife Conflict Since 1990 by County**

County	Nyi ma	Shen tshwa	Mtsho gnyis	Number of Households	Percent of Total Surveyed
Number of Surveyed Households Experiencing Wildlife Conflict Since 1990	86	86	88	260	87
Number of Surveyed Households NOT Experiencing Wildlife Conflict Since 1990	14	14	12	40	13

*Note: Because one-hundred households were surveyed in each county, county figures also represent percentages for individual counties.*



*Figure 4.1. Percentage of surveyed households reporting having experienced wildlife conflict since 1990 by county.*

***Overall Wildlife Conflict by Species***

Human-wildlife conflict involving the Byang thang’s five largest predators and grazing competition with all wild ungulate species as a whole were analyzed (Table 4.2, Figure 4.2).

**Table 4.2. Percentage of Surveyed Households Reporting Having Experienced Wildlife Conflict Since 1990 by Species**

Species	Percentage of Surveyed Households Experiencing Conflict
Bear	49
Snow Leopard	24
Wolf	21
Fox	13
Lynx	5
Grazing Competition	36

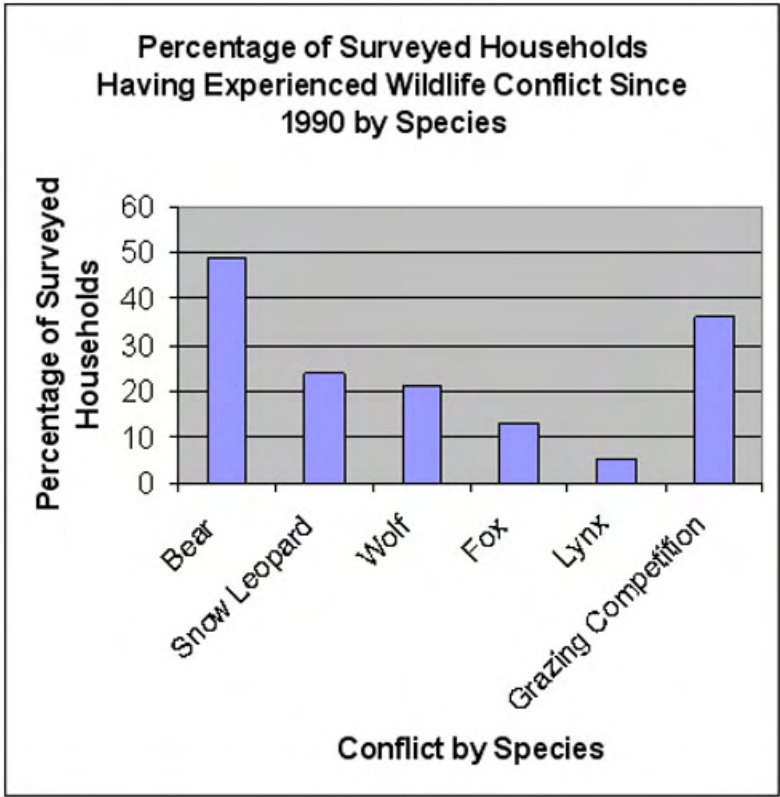


Figure 4.2. Percentage of surveyed households reporting having experienced wildlife conflict since 1990 by species.

From Figure 4.2, it can be seen that the endangered Tibetan brown bear was the largest source of human-wildlife conflict amongst surveyed herders, with 49 percent of all surveyed households reporting conflict with brown bears since 1990, while 36 percent reported grazing competition conflict, 24 percent reported conflict with the endangered snow leopard, and 21 percent reported conflict with the ubiquitous wolf. At 13 percent and 5 percent of all surveyed households, conflict with fox and lynx, respectively, were relatively minor problems.

**Wildlife Conflict by Species and County**

When human-wildlife conflict was analyzed by county, an interesting pattern of geographic distribution of wildlife conflict caused by individual species emerged for the survey area (Table 4.3, Figure 4.3)

From Figure 4.3 it can be clearly seen that the Tibetan brown bear was a particularly large problem for herding households in Shentsa and Tsonyi Counties, affecting 60 percent and 52 percent of surveyed households in these counties, respectively, since 1990, while only being somewhat less of a problem in Nyima

County, where 34 percent of households surveyed reported conflict with brown bears. Mountainous Shentsa County had far and away the largest snow-leopard problem, with 50 percent of all surveyed households reporting having experienced conflict with snow leopards since 1990, more than three times the reported incidence of snow leopard conflict amongst surveyed households in Nyima County and more than eight times that of Tsonyi County. Incidence of wolf conflict was fairly uniform across the survey area at 20 percent, 20 percent, and 22 percent of surveyed households in Nyima, Shentsa, and Tsonyi Counties, respectively. While overall conflict with fox and lynx was relatively minor in extent, fox conflict was a fairly large problem in Tsonyi County, where 24 percent of households reported experiencing fox conflict since 1990. Of sixteen households reporting conflict with lynx since 1990, fifteen were located in Nyima County. Nyima County also had by far the largest problem with wild ungulates, with 63 percent of households reporting grazing competition conflict since 1990, as compared with just 35 percent of surveyed households in Tsonyi County and 11 percent of surveyed households in Shentsa County.

**Table 4.3. Percentage of Surveyed Households Reporting Having Experienced Wildlife Conflict Since 1990 by Species and County**

Species	County			Percent of Total Surveyed
	Nyi ma	Shen tshwa	Mtsho gnyis	
Bear	34	60	52	49
Snow Leopard	15	50	6	24
Wolf	20	20	22	21
Fox	9	7	24	13
Lynx	15	0	1	5
Grazing Competition	63	11	35	36

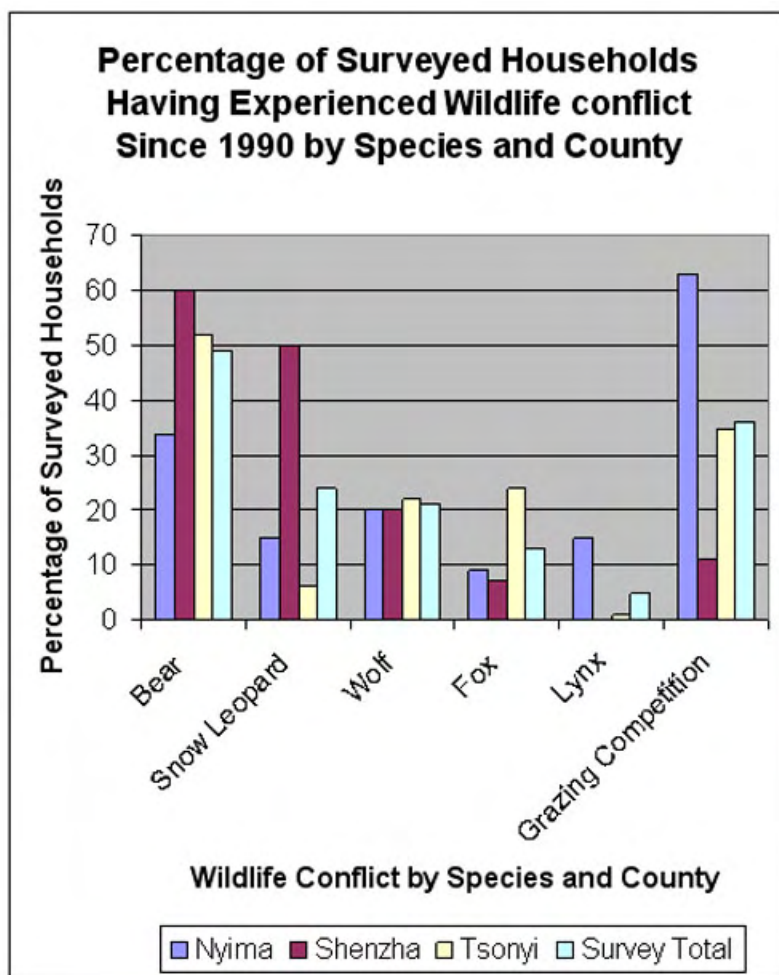


Figure 4.3. Percentage of surveyed households reporting having experienced wildlife conflict since 1990 by species and county.

### ***Analysis of Wildlife Conflict by Species and Time Period***

For the sake of convenience of analysis, wildlife conflict over the period under investigation was sub-divided into three roughly equal time periods, the six-year period from January 1990 to December 1995, the five-year period from January 1996 to December 2000, and the five-year and four-month period from January 2001 to April 2006. Because a number of survey respondents were not old enough to have been heads of households during the first two time periods, it was necessary to estimate the number of extant households in each of the first two survey time periods. In order to arrive at this estimate, it was simply assumed that respondents, as heads of households, had to have been at least eighteen years of age in the last

year of the first two time periods, 1995 and 2000, for their household to have existed in that time period. Thus by eliminating respondents younger than eighteen years of age in each of the first two time periods, we arrive at an estimated 258 of the surveyed households being extant in the first survey time period, 1990-1995, and an estimated 287 of the surveyed households being extant in the second survey time period, 1996-2000. The breakdown of estimated extant households in each time period by county is given below (Table 4.4).

**Table 4.4. Estimated Number of Extant Surveyed Households in Each of the Three Survey Time Periods by County**

Time Period	County			Total by Time Period
	Nyi ma	Shen tshwa	Mtsho gnyis	
1990-1995	90	86	82	258
1996-2000	95	96	96	287
2001-2006	100	100	100	300

When broken down into these three five to six year time periods from January of 1990 to April of 2006, analysis of wildlife conflict among surveyed households by time period and species showed a clear and dramatic roughly two to over five-fold increase in conflict over the three survey time periods (Table 4.5, Figure 4.4). While memories fade, and exact years are forgotten, it was nevertheless felt that a time period analysis of wildlife conflict in the Jangtang National Nature Reserve would be of great interest in chronicling the impact of the establishment of the Jangtang and Ziling Lake Reserves on human-wildlife conflict in the survey area. So while exact years of occurrence of wildlife conflict can not always be determined amongst nomadic herders who are often even unsure of the years and dates of birth of their children, the estimated dates of wildlife conflict given nevertheless show that the incidence of human-wildlife conflict has risen dramatically since 2001.

This dramatic rise in conflict can be attributed to several factors. Although the Jangtang and Ziling Lake Reserves were created in 1993 as provincial level nature reserves, in 1999 new management plans and management structures for these reserves were established, with more vigilant anti-poaching patrols being set-up. This was followed by a campaign to collect all weapons and traps from the inhabitants of these reserves beginning in 2001. In 2001, the Jangtang and Ziling Reserves were also elevated from provincial-level to national-level nature reserves, giving further impetus to putting an end to all forms of hunting in these reserves, as well as to hunting of endangered species in the buffer zones of these reserves.<sup>10</sup> Together, these actions have resulted in the dramatic decreases in commercial poaching and subsistence hunting seen today. Consequently, with most occupants

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<sup>10</sup> Fox and Tsering, "Biodiversity Conservation and Natural Resource Exploitation on Tibet's Northwest Chang Tang Highlands."

of the reserves now having been disarmed, the behavior of wild animals in the Byang thang has become increasingly aggressive with respect to humans, their livestock, and their pastures. Wild animals are no longer as conditioned to fear humans due to the decline in killing of wildlife resulting from enforcement of wild life protection laws, which has in turn led to a surge in the numbers of wild predators seeking out human sources of food, particularly a large increase in the killing of livestock in herding camp pens by emboldened predators.

**Table 4.5. Percentage of Surveyed Households Reporting Having Experienced Wildlife Conflict Since 1990 by Species and Time Period**

Species	Time Period		
	1990-1995	1996-2000	2001-2006
Bear	9	11	39
Snow Leopard	3	4	17
Wolf	6	7	17
Fox	5	5	12
Lynx	1	1	5
Grazing Competition	7	8	34

*Note: See Table 4.4 for the estimated number of extant surveyed households in each of the three survey time periods by county.*



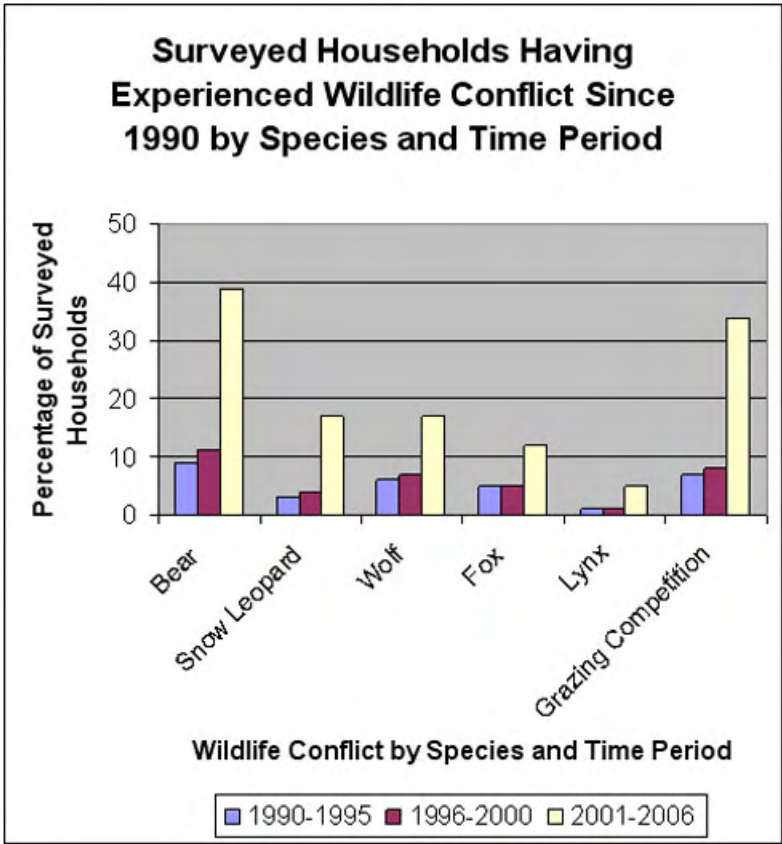


Figure 4.4. Percentage of surveyed households reporting having experienced wildlife conflict since 1990 by species and time period.

It should be noted that surveyed herders were most interested in discussing the recently arisen phenomena of widespread bear conflict, and to a lesser extent conflict with snow leopards, while conflict with wolves, lynx, and fox was considered a normal, expected, part of their lives and may have been under reported. There are three primary reasons for this. The first is that widespread conflict between herders and brown bears and snow leopards is a relatively new phenomena that is a direct result of newly implemented wildlife protection policies, whereas in former times herders shot brown bears on sight and widely trapped snow leopards, thus suffering minimal economic losses from these two species. The second reason for their interest in discussing conflict with bears and snow leopards is that, while fox, lynx, and wolf may take one or even several sheep or goats in a single incident, brown bears and snow leopards loose in livestock sheep pens frequently kill a dozen head of livestock in a single incident, and it is not uncommon for both bears and snow leopards to kill seventy-five sheep in a single raid. Thus, with herders now prohibited from taking up arms against all types of predators in

the Byang thang region, it is not surprising that herders are most vocal about conflict with bears and snow leopards, which pose by far a much larger economic threat to herding households than fox, lynx, and wolf. The third, and perhaps most important, reason herders are so vocal about conflict with bears is that bears make direct attacks on houses and tents, sometimes repeatedly, even when these dwellings are occupied, instilling great fear of and anger towards bears, as well as occasionally attacking herders themselves.

Analysis of Human-Bear Conflict

With 49 percent of surveyed households reporting having experienced conflict with Tibetan brown bears since 1990, brown bears are by far the single species inflicting the most widespread economic losses on herders residing in and around the Jangtang and Ziling Lake Nature Reserves. Losses inflicted by brown bears are diverse in form and include livestock kills; loss of human food supplies; direct damage to corrals, homes, and home furnishings; and occasionally direct physical injury or even death of household members (Photos 3 and 4).



Photo 3. Roof of a herder's cabin torn open by a Tibetan brown bear, Tsonyi County, 2004.



Photo 4. Herder's cabin ransacked by a Tibetan brown bear, Nyima County, 2005.

Bear Conflict by County and Surveyed Socio-Economic Factors

Bear conflict data was analyzed as a function of county, residence type, living arrangement, and self-assessed economic status (Tables 5.1-5.4).

Table 5.1. Percentage of Surveyed Households Reporting Having Experienced Bear Conflict Since 1990 by County

	County			
Species	Nyi ma	Shen tshwa	Mtsho gnyis	Survey Total
Bear	34	60	52	49

**Table 5.2. Percentage of Surveyed Households Reporting Having Experienced Bear Conflict Since 1990 by Residence Type**

Species	Residence Type		
	House	Tent	Mixed
Bear	34	47	63

**Table 5.3. Percentage of Surveyed Households Reporting Having Experienced Bear Conflict Since 1990 by Living Arrangement**

Species	Living Arrangement	
	Group	Individual
Bear	49	48

**Table 5.4. Percentage of Surveyed Households Reporting Having Experienced Bear Conflict Since 1990 by Self-Assessed Economic Status**

Species	Self-Assessed Economic Status		
	Poor	Middle Class	Rich
Bear	43	49	60

As can be seen from the above four tables, human-bear conflict was widespread, cutting across all surveyed socio-economic factors, and seemed to be primarily a function of geographic location and, to a lesser extent, residence type. In terms of geography, Shentsa County had the highest incidence of bear conflict in the survey area, with 60 percent of households in that county reporting having experienced bear conflict since 1990 (Table 5.1). When analyzed on the basis of residence type, 47 percent of tent dwelling households reported experiencing conflict since 1990, though tent dwellers only comprised only 6 percent of all households surveyed, a much higher rate than for house dwellers, 34 percent of which reported experiencing conflict with bears (Table 5.2). This may be a result of the statistically small number of tents surveyed, however the author’s can offer no satisfactory explanation for this discrepancy since tents are generally occupied year round and are presumed to be better guarded than seasonally vacant houses. One possible explanation for the lower rate at which house dwellers were affected by bear conflict is that some house dwelling families reside in township centers in winter, which have a year-round human presence that may reduce the likelihood of bears raiding these winter homes while the family is away in summer. However, “mixed” household types dividing the year between tents and houses, which made up 48 percent of all households surveyed, also had the largest reported incidence of bear conflict at 63 percent (Table 5.2). This may be explained in part by the fact that many of these households reported that their winter cabins were raided by bears in search of food while families were away at summer camp.

Forty-eight percent of individual households surveyed reported experiencing bear conflict since 1990 versus 49 percent of group living arrangements (Table

5.3). Thus living in groups of up to five families, though more typically just two to three families, appears to offer no deterrent to keep bears from raiding herding camps. In terms of economic status, 43 percent of surveyed “poor” families reported having experienced bear conflict since 1990, as opposed to 49 percent of middle-class families and 60 percent of rich families (Table 5.4). The higher rate of incidence of bear conflict among “rich” households may be due in part to the fact that wealthier households have larger numbers of livestock per family member, which makes it more difficult to adequately protect large dispersed herds from predation by bears. Another factor contributing to higher rates of bear conflict amongst “rich” households may be that wealthier families generally owned more than one home, one of which is left unoccupied seasonally and thus is more prone to attack by bears in search of food. In fact some poor households have so few animals that they leave them in the care of friends or relatives with larger herds, and many poor families supplement their minimal herding incomes by having a family member take a job in the local township doing cleaning, cooking, or working in a shop, possibly explaining in part the somewhat lower rate of bear conflict among poor families.

Thus, as can be seen from the above data, no clear patterns emerges between the three surveyed socio-economic factors, residence type, living arrangement, and self-assessed economic status, and the likelihood of a household experiencing conflict with brown bears. The clearest pattern of human-brown bear conflict appears to be geographic, not socio-economic, in nature, as indicated by the county data (Table 5.1). In retrospect a better indicator of the likelihood of a herding camp experiencing conflict with both brown bears and snow leopards would probably be the proximity of a camp to escape cover such as rock outcrops, cliffs, canyons, hills, and ridges, with camps in close proximity to these features being more likely to experience conflict and camps in the middle of large open plains being least likely to experience conflict with these two large predators. However, no attempt was made to quantify distance to escape cover in the course of this survey. Regardless of location and socio-economic status, human-bear conflict is a large problem in the region of the Jangtang and Ziling Nature Reserves, and resolving this issue is a matter of great importance if the Tibetan brown bear is to continue to exist in its traditional manner, in which its survival is largely based on its ability to hunt pikas rather than on its ability to raid herding camps in search of livestock and human foodstuffs.

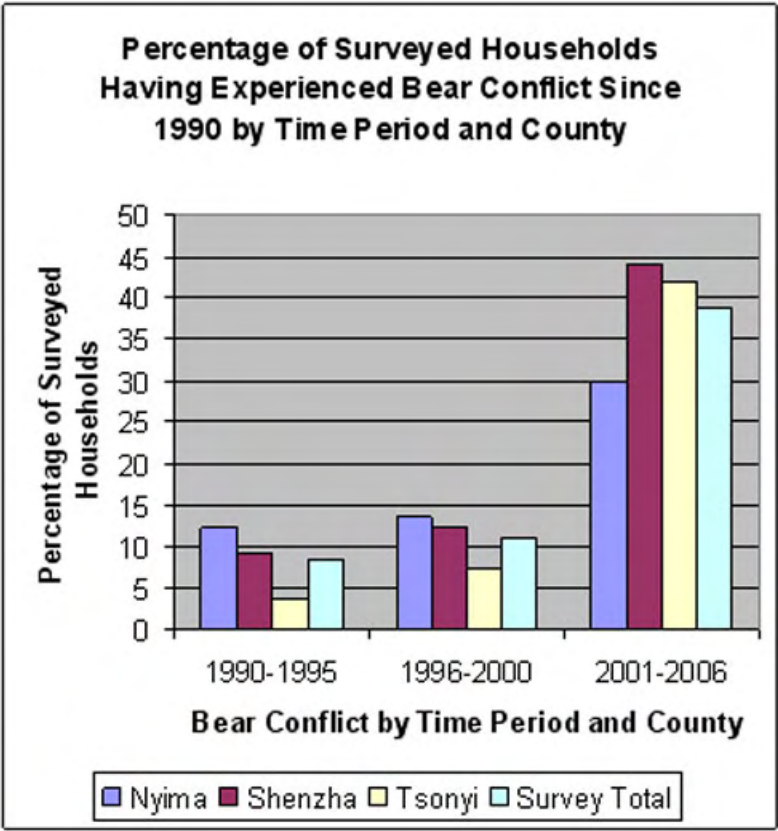
### ***Human-Bear Conflict by Time Period and County***

When analyzed on a county by county basis, dramatic increases in the frequency of human-bear conflict over the three survey time periods become readily apparent in all three counties (Table 5.5, Figure 5.1).

**Table 5.5. Percentage of Surveyed Households Reporting Having Experienced Bear Conflict Since 1990 by Time Period and County**

Species: Bear	County			
Time Period	Nyi ma	Shen tshwa	Mtsho gnyis	Survey Total
1990-1995	12.2	9.3	3.7	8.5
1996-2000	13.7	12.5	7.3	11.1
2001-2006	30.0	44.0	42.0	38.7

*Note: See Table 4.4 for the estimated number of extant surveyed households in each of the three survey time periods by county.*



*Figure 5.1. Percentage of surveyed households reporting having experienced bear conflict since 1990 by time period and county.*

As the above figure shows, since creation of the Jangtang and Ziling Lake Nature Reserves and implementation of the 2001 weapons confiscation program, the number of households experiencing human-bear conflict has increased roughly four and half times, most dramatically in Tsonyi County, where there has been an over eleven fold increase in the incidence of bear conflict.

In addition to data gathered in the April 2006 WWF Human-Wildlife Conflict Survey, the forestry bureaus of the counties that overlap the Jangtang and Ziling Lake Nature Reserves have all collected township-level data on human-wildlife conflict since at least 2001, with a few townships having records dating back to 1998. These records detail economic losses to herders caused by wildlife and are presently being used to assist in developing a system of compensation for victims of wildlife conflict that is hoped will discourage the retaliatory killing of the nature reserves' large fauna. Data from Nyima and Shentsa Counties are excerpted in Tables 5.6 and 5.7, below.

**Table 5.6. 2000 to 2005 Shentsa County Bear and Snow Leopard Conflict Data**

Year	Sheep and Goats Killed	Yaks Killed or Driven Off	Rooms of Dwellings Damaged	Foodstuffs Lost to Wildlife (kg)
2000	1138	9	18	3720
2001	1264	13	29	4243
2002	1389	25	41	5067
2003	1453	32	59	5961
2004	1579	47	71	6394
2005	3894	97	107	10,252
Totals	10,717	223	325	35,636

Source: Shentsa County Forest Police Office (*shen tshwa rdzong nags las spyi bde cus*, Shenzha Xian Linye Gongan Ju)

**Table 5.7. 1999 to 2005 Nyima County Bear Conflict Data from Ten of Fourteen Townships for Which Complete Annual Data Exists**

Year	Households Affected	Sheep and Goats Lost	Foodstuffs Lost to Wildlife (kg)	Rooms of Dwellings Damaged	Monetary Loss (USD)
1999	120	892	3181	47	19,361
2000	170	1236	4533	56	24,730
2001	158	1298	6005	77	26,681
2002	128	905	4820	66	17,196
2003	196	1523	5708	98	28,204
2004	173	991	7074	77	26,056
2005	272	1067	15,685	190	40,131

Totals	1217	7912	47,006	611	182,359
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Source: Nyima County Forestry Bureau (*nyima rdzong nags las spyi bde cus*, Nima Xian Linye Gongan Ju)

Note: Includes data from the following townships (*grong brdal, zhen*): *A zur* (Asuo), *Lcags sgo* (Jiagu), *'Om phu* (Wenbu), *'Brong tshang* (Zhongcang), *'Gro ba* (Zhuowa), *Cun tshang* (Juncang), *Nyi ma*, *Srin ya* (Shenya), *Legs mdog* (Laiduo), and *Gro nyi* (Zhuoni). The following townships did not have complete annual records and were therefore omitted from this table: *Lci ba* (Jiwa), *Rta mgo* (Daguo), *Dngul chu* (Ejiu), and *Rong ma* (Rungma).

Based on reported data, Shentsa County is clearly the county in the study area with the most severe bear and wild predator conflict problem, with 311 households reporting 3,894 sheep and goats killed by bears and snow leopards in 2005, more than three and half times the 1,067 sheep and goats reported killed by the ten reporting townships in Nyima County in 2005 (Tables 4.3, 5.5, and 5.6). However, in 2005, the ten reporting townships in Nyima County reported a total of 15,685 kilograms of foodstuffs lost to bears, a figure about 50 percent higher than 10,252 kilograms reported lost to wildlife in Shentsa County in 2005.

The important thing to note about Tables 5.6 and 5.7 above is the steady increase in economic losses resulting from wildlife conflict over the six to seven year periods given for Shentsa and Nyima Counties, respectively, and the particularly sharp increases which occurred in both counties between 2004 and 2005. In Shentsa County increases in wildlife conflict between 2004 and 2005 saw with the reported number of goats and sheep killed soaring from 1,579 animals to 3,894 animals, the number of yaks being killed or driven off more than doubling from forty-seven to ninety-seven, the amount of foodstuffs lost increasing from 6,394 kilograms to 10,252 kilograms, and dwellings damaged increasing from 71 incidents to 107 incidents. In Nyima County, increases in wildlife conflict between 2004 and 2005 were nearly as dramatic, with the number of households reporting conflict increasing from 173 to 272, foodstuffs lost more than doubling from 7,074 kilograms to 15,685 kilograms, number of dwellings damaged increasing from 77 incidents to 190 incidents, and annual dollar loss increasing from \$26,056 to \$40,131. However, between 2004 and 2005 sheep and goat kills only increased marginally in Nyima County, from 991 head to 1,067 head.

As tables 5.6 and 5.7 indicate, economic losses resulting from human-wildlife conflict can deal a severe financial blow to the affected herding families, many of which only have annual incomes on the order of US \$400. While wildlife attacks on herders themselves appear to be increasing, with twenty reported wildlife attacks on herders having been reported in Shentsa County, Nyima County, Tsonyi County, Amdo County (*a mdo rdzong*, *Anduo Xian*), Rutok County (*ru thog rdzong*, *Ritu Xian*), Getsé County (*dge rtse rdzong*, *Gaize Xian*), and Gegyé County (*dge rgyas rdzong*, *Geji Xian*) in 2005, herder deaths resulting from these attacks continue to be relatively rare, though regular occurrences.<sup>11</sup> In the eight-year period from 1998 to 2005, only three of the seven reserve counties listed above reported herder deaths resulting from wildlife attacks, with a total of seven reported deaths, five caused

<sup>11</sup> Tsering Dawa, John D. Farrington, and Kelsang Norbu, "Human-Wildlife Conflict in the Chang Tang Region of Tibet: The Impact of Tibetan Brown Bears and Other Wildlife on Nomadic Herders with Recommendations for Conflict Mitigation" (Lhasa: WWF China-Tibet Program, 2006).

by Tibetan brown bears and two caused by wild yaks (Table 5.8). However, by way of comparison, in Alaska (*a la si ka, Ala Sijia*), which has both a much larger area and human population than the TAR Byang thang, only fifty-six human deaths resulting from bear attacks were recorded in the 103-year period from 1900 to 2002.<sup>12</sup>

**Table 5.8. Humans Killed by Tibetan Brown Bears and Wild Yaks in Counties Overlapping the Jangtang and Ziling Lake Nature Reserves from 1998 to 2005**

Year	County			Annual Totals
	Nyi ma	Mtsho gnyis	A mdo	
1998	1-Brown Bear			1
1999	1-Brown Bear			1
2000	1-Brown Bear	1-Wild Yak		2
2001				0
2002			1-Brown Bear	1
2003	1-Brown Bear			1
2004				0
2005		1-Wild Yak		1
County Totals	4	2	1	7

Source: County Forestry Bureaus

From 1998 to 2005, no herder deaths resulting from wildlife attacks were reported in the following Jangtang Reserve counties: Rutok, Gegyé, and Getsé Counties of Ngari Prefecture (*mnga' ris sa gnas, Ali Diqu*). In spite of being the county most severely affected by conflict with bears and snow leopards, Shentsa County reported no deaths from wildlife attacks in the period from 1998 to 2005.

### ***Causes of Human-Bear Conflict***

The incidence of human-bear conflict throughout the Byang thang region is clearly on the rise, with the number of households reporting experiencing human-bear conflict having increased roughly four and half times since 1990, with a dramatic surge in this conflict being recorded between 2004 and 2005. The increase in reports of human-bear conflict in recent years may be partially explained by improved record keeping and increased awareness of official interest in this issue amongst affected herders. However, the authors feel that the primary causes of the

<sup>12</sup> Tom S. Smith and Steven Herrero, *A Century of Bear-Human Conflict in Alaska: Analyses and Implications* (Anchorage: USGS Alaska Science Center, 2003), [http://www.absc.usgs.gov/research/brownbears/attacks/bear-human\\_conflicts.htm](http://www.absc.usgs.gov/research/brownbears/attacks/bear-human_conflicts.htm) (accessed December 18, 2007).



large recent increases in reported human-bear conflict are the direct result of recent changes in wildlife protection policy, increases in human and livestock populations, and subsequent changes in predator behavior, and are not simply the result of improved reporting and record keeping. These factors include the following:

- The creation of the provincial Jangtang and Ziling Lake Nature Reserves in 1993, at which time all hunting of wildlife was prohibited in these vast areas. In 2001 these nature reserves were elevated to national-level protected status, and wildlife protection laws began to be more rigorously enforced, while at the same time reserve-wide gun and trap confiscation programs were carried out. These efforts have contributed to a suspected small increase in the population of brown bears in the Byang thang region in recent years and are believed to have emboldened brown bears which now have less to fear from humans. Thus these actions are thought to be in large part responsible for the increased occurrence of human-bear conflict in the survey area.
- Human and livestock numbers, as well as bear populations, are increasing in the survey area, leading to the increased potential for bears to come into conflict with humans and their livestock.
- With improved wildlife protection efforts in the reserve, there is now growing overlap between areas occupied by humans, bears and other wildlife, as increasing wildlife populations re-occupy the reserves more productive southern grasslands, from which they had largely been displaced by herders and their livestock in recent decades.
- Since the livestock privatization program began in the early 1980s, herd sizes have increased while simultaneously the size of production teams, now often a single family, have decreased. This has led to the reduced ability of each herder to adequately guard his livestock, thus increasing the likelihood of these domestic animals being killed by bears and other predators.
- As in the American west and elsewhere, bears in the Byang thang have become increasingly habituated to subsisting by killing livestock and raiding human food supplies, and are increasingly dependent on human sources of food as opposed to their natural food base, the black-lipped pika, upon which brown bears in the Byang thang were primarily dependent prior to permanent settlement of the region by nomadic herders in the latter part of the twentieth century.<sup>13</sup> Regrettably, many bear cubs may no longer be learning to hunt pikas and marmots, which will only serve to perpetuate the problem of human-bear conflict in the Byang thang region.

### ***Bear Sightings by Herders***

While prone to exaggeration, herders' views on Tibetan brown bear populations in their home territories are nevertheless of great interest to researchers. When

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<sup>13</sup> Schaller, *Wildlife of the Tibetan Steppe*, 195.

herders were asked if there were bears “in the vicinity” of their camps, 278 herders (93 percent) responded that there were, and of these 278 herders, 258 (86 percent) claimed to have seen the bear themselves. Survey results show that bear conflict is an extremely large problem for herders, and given that 93 percent of all respondents claimed to have bears living in the vicinity of their camps, one could conclude that bears in the Byang thang are, at present, not exhibiting much fear of humans. However, of the 258 herders claiming to have seen bears “in the vicinity” of their camps, only 138 had done so in the preceding year, with one-hundred respondents claiming to have seen bears more than once in the past year, and seven respondents claiming to have seen bears in the vicinity of their camps more than ten times in the past year. While the 138 herders sighting bears in the past year is far less than the 258 claiming that there are bears in the vicinity of their camps, it is still an extremely large number and gives an indication of the great potential for herders to come into conflict with bears.

### ***Herders’ Views on Bear Ecology***

In addition to being asked about bear conflict and bear sightings, herders were also asked about their opinions on the state of bear ecology in the survey region, specifically on relative abundance of bears, whether they felt bear numbers were increasing, and what they felt were the main threats to bears today. When herders were asked if brown bears were rare, common, or abundant both ten years ago and today, 26 percent of herders responded that brown bears were rare ten years ago vs. 3 percent that felt that brown bears were rare today. Fifty-four percent of respondents felt that brown bears were common ten years ago vs. 50 percent that felt brown bears were common today, while 11 percent of herders responded that brown bears were abundant ten years ago vs. 38 percent who felt that brown bears were abundant today. When herders were asked if brown bears were presently increasing or decreasing, 70 percent of respondents felt that bear numbers were increasing vs. just 2 percent of respondents who felt that bear numbers were decreasing.

From the responses to the above two survey questions it is clear that the herders surveyed in the Byang thang generally felt that bears were common ten years ago, are more numerous today than in the past, and that their numbers are increasing. However, given the low reproductive rate of the Tibetan brown bear, the vast home range presumably needed to support a single bear in a low-productivity ecosystem like that of the Jangtang Reserve, and the booming international trade in bear gallbladder and other bear parts, it is highly unlikely that the Tibetan brown bear population has increased by more than a few percentage points since creation of the Jangtang Reserve in 1993. However, with the number of households experiencing human-bear conflict more than quadrupling in this same time period, it is not surprising that many local herders feel that bear numbers have increased rapidly over the past thirteen years.

Many herders also stated that the hibernation period of bears in the Byang thang has been getting shorter in recent years because human sources of food have become

readily available to bears, whereas before bears remained dormant until frozen ground thawed in spring, permitting pikas to be dug out of their burrows. This reported lengthening of the annual period of bear activity has no doubt also contributed to the increased incidence of human-bear conflict and to the perception that bear numbers are increasing rapidly. However, as discussed above, herders commonly exaggerate bear numbers since there is great economic incentive to kill bears to protect livestock and property, and because there is generally great resentment about the bear problem in the Byang thang, with many survey respondents feeling that brown bears are not in need of protected status and that the government is more concerned about bears than people. Such attitudes may, in the long run, be detrimental to protecting all types of wildlife in the Byang thang.

Even more surprising though, is the general, possibly disingenuous, misperception of present threats to Tibetan brown bears. When herders were asked what posed the greatest threat to Tibetan brown bears, 46 percent responded that lack of food was the greatest threat, while 35 percent responded that no threats to bears exist. Only two of three-hundred respondents (0.7 percent) felt that humans were the greatest threat to bears. In spite of 81 percent of respondents replying that the biggest threat to bears in the Byang thang was the lack of food or that no threats to bears exist, in the opinion of the authors, humans still pose the single largest threat to the continued survival of the Tibetan brown bear. Whether killed to protect livestock and property, due to an economic need to earn extra money by selling bear parts, out of fear, or simply for sport, historical accounts indicate that the population of the Tibetan brown bear has plummeted throughout its range in the past century, and these bears have been largely eliminated from the open steppe and are now mainly confined to mountainous terrain, which may explain the higher incidence of bear conflict in mountainous Shentsa County.<sup>14</sup>

However, the responses to the above questions do reflect a tremendous need for wildlife conservation education programs in the Jangtang and Ziling Lake Reserves, and an urgent need for implementing measures to reduce human-bear conflict, such as by improving food storage and camp sanitation, improving home and livestock corral construction, putting bear fences around living compounds, and possible relocation of livestock from areas experiencing exceptionally high frequency of human-bear conflict. Through such efforts to prevent brown bears from developing a preference for human foods and livestock it is hoped that economic losses to herders caused by bears can be reduced, and that the Byang thang's bears can be "kept wild" and reliant on their natural food sources, primarily the black-lipped pika.

### ***Selected Recent Reports of Bear Conflict***

The following reports of human-bear conflict from Shentsa and Nyima Counties are illustrative of the severity of the bear conflict problem in the Byang thang region at the present time.

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<sup>14</sup> Schaller, *Wildlife of the Tibetan Steppe*, 192.

### 2003 – Shentsa County

One evening in Shentsa Township (*shen tshwa grong brdal*, *Shenzha Zhen*) Village #7, three marauding brown bears entered the village and broke into three houses and two tents, destroying many items of furniture and consuming or destroying four sheep carcasses and 1,172 kilograms of food stuffs. The bears also entered two sheep pens and killed seventy-five sheep.<sup>15</sup>

### April 2003 – Nyima County

On April 29th, a sixty-two year old herder from Chüntsang Township (*cun tshang grong brdal*, *Juncang Zhen*) Village #3 was returning home when he was attacked by a brown bear. He was bitten in the neck, had the skin torn off his face, and died. Adding to the tragedy was the fact that the herder was the sole provider for his small family which consisted of his mentally ill first wife, his disabled second wife, and his senile older sister. As the family was childless, no one was left to care for the family's yaks and sheep.<sup>16</sup>

### August 2003 – Shentsa County

On the nights of August 3rd and 4th brown bears and a wolf killed seventy-five sheep and goats in Mayor Township (*ma yor grong brdal*, *Mayue Zhen*) Village #2. A week later a brown bear entered the same village and killed thirty more sheep. Two nights later on August 13th, a bear entered neighboring Mayor Township Village #3 and killed nineteen sheep and goats. The total economic loss from these livestock kills was US \$2,325.<sup>17</sup>

### July 2004 – Shentsa County

On July 27th and 28th two brown bears entered Baktsa Township (*bag tshwa grong brdal*; *Bazha Zhen*) Village #12 and killed thirty-five sheep and twenty-five goats.<sup>18</sup>

### September 2004 – Shentsa County

On the night of September 10th, a brown bear entered Shentsa Township Village #6 and broke into a herder's house by ripping off the roof, then proceeded to break furniture and eat dried meat resulting in US \$885 in damages.<sup>19</sup>

### April 2006 – Tsonyi County

Mr. Wanggyal, the governor of Barling Township (*bar gling grong brdal*, *Balin Zhen*), stated that "in the old times there were robbers to make our lives uneasy, now we have brown bears to put our lives in danger. In Barling Township Village

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<sup>15</sup> Source: Shentsa County Forestry Bureau Records.

<sup>16</sup> Source: Nyima County Forestry Bureau Records.

<sup>17</sup> Source: Shentsa County Forestry Bureau Records.

<sup>18</sup> Source: Shentsa County Forestry Bureau Records.

<sup>19</sup> Source: Shentsa County Forestry Bureau Records.

#2, a bear broke the windows of a house owned by a herder named Wangchok while people were sleeping inside. One herder named Najee can no longer stay at his pasture because a bear visits his house frequently and he has had to move to the township center. Another herder, Ganyi, ties his horse to the gate of his sheep pen because people believe bears are afraid of horses, and now he sleeps on the roof of his house.<sup>20</sup>

### ***Killing of Tibetan Brown Bears in the Jangtang Reserve***

Killing of bears in the Byang thang region is likely to have decreased significantly since the late 1990s due to bans on hunting and firearms in nature reserves, but from herder survey responses it is clear that the killing of bears continues to be a regular occurrence in and around reserves in the Byang thang. However since the establishment of the Jangtang and Ziling Lake Nature Reserves in 1993, hunting by non-herders is believed to have decreased, while killing of bears by herders defending their livestock and property is thought to have increased (Photo 5).



*Photo 5. A Tibetan brown bear killed by herders in Nyima County after it attacked a house in late 2004.*

Although survey respondents were asked about bears killed by humans in their localities, given the penalties for doing so it is not surprising that few herders were willing to admit to killing bears themselves. However, survey respondents were much less reticent to talk about bears killed by third parties and many reported hearing of bears being killed by neighbors or herders in nearby townships. Given the hearsay nature of these reports and

the fact that multiple neighbors often reported the same recent bear kill, it proved impossible to make an accurate estimate of the number of bears killed in the survey area in recent years. Nevertheless, with thirty-nine of three-hundred survey respondents reporting seeing or hearing about bears killed by herders since 2000, it is clear that the killing of bears in the survey area continues, and that Tibet's small population of endangered brown bears continues to be threatened by humans.

### **Conclusions**

Widespread human-brown bear conflict is a new phenomena in the southern Byang thang, which is largely the result of creation of the Jangtang and Ziling Lake Nature Reserves in 1993 and the subsequent hunting ban and weapons confiscation program implemented on the vast territory of these reserves. In the three decades prior to creation of the reserves, Tibetan brown bears were the target of both recreational and commercial hunters, while nomadic herders have long shot bears on sight,

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<sup>20</sup> Source: WWF April 2006 Wildlife Conflict Survey.

both out of an innate fear of bears and to protect livestock. As a consequence, bears remained wary of humans. However, in a “Yosemite-type” situation, since creation of the reserves, establishment of penalties for killing reserve wildlife, and the confiscation of weapons, bears have quickly learned that there is now little to fear from humans and have become habituated to killing livestock and raiding homes in search of meat, flour, and oil. As a result, the incidence of conflict between brown bears and herders has soared in the past five years, a problem which has only been further exacerbated by the continued encroachment on bear habitat by increasing populations of humans and their livestock.

At present, bears conditioned to feasting in homes and livestock corrals are uncontrollable, and emboldened bears are now increasingly reliant on human sources of food for their survival. Local herders are very emotional about the bear problem, which is causing many of them devastating economic losses directly as a result of newly created nature reserve policies. The problem has grown so rapidly in the past few years that, based on widespread second-hand accounts, it is now believed that the largely undocumented retaliatory killing of bears by individual herders attempting to protect their property and livelihoods poses the largest threat to the continued survival of the Byang thang region’s brown bears. While the impetus behind these killings is the protection of livestock and property, once killed, many bear parts undoubtedly find their way on to the black market for wildlife products, providing further incentive to kill bears.

Thus more research and planning is needed to develop strategies to mitigate, reduce, and eliminate human-bear conflict in the Byang thang region so that the majority of herders will continue to refrain from killing bears and insure the continued existence of this unique subspecies of brown bear. At present Tibetan brown bears are the single largest source of human-wildlife conflict in the Byang thang region of the TAR, killing livestock, severely damaging homes and furnishings, raiding human food supplies, and occasionally attacking herders. While not entirely applicable to the steppe dwelling, nomadic herding society of the TAR, many national, state, and provincial government agencies in the United States (*ari*, *Meiguo*) and Canada (*khe na ta*, *Jianada*) have long experience in dealing with human-bear conflict issues, particularly with the grizzly bear, and a review of the diverse bear conflict reduction and personal safety strategies developed by these agencies for grizzly bears would no doubt be an excellent point of departure for developing similar strategies for assisting herders in the Byang thang. Such strategies include improved food, garbage, and animal feed storage practices; training dogs to keep bears away from ranches; training outdoorsmen in the use of bear spray and on what to do if they encounter a bear; tagging and relocating problem bears; aversive conditioning – e.g., scaring bears with air horns or non-lethal rubber bullets; as well as livestock relocations and creation of compensation funds.<sup>21</sup>

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<sup>21</sup> Teresa Augustyn, *An Evaluation of Grizzly Bear-Human Conflict in the Northwest Boreal Region of Alberta (1991 to 2000) and Potential Mitigation: Alberta Species At Risk Report No. 10* (Edmonton: Fisheries and Wildlife Management Division - Resource Status and Assessment Branch, Alberta

Brown bear populations in the Jangtang Reserve are now believed to be slowly increasing as a result of recently introduced wildlife protection policies and increased access to high-calorie human foods. At the same time, the numbers of humans and their livestock occupying bear habitat continue to grow each year, with there already having been twenty-two thousand people and an estimated 1.4 million head of livestock in the Jangtang Reserve as early as 1993.<sup>22</sup> Therefore, the problem of human-bear conflict in the Byang thang is only likely to increase in the immediate future. Thus, if herders and this unique subspecies of brown bears are to continue to coexist in the Byang thang, it is urgent that immediate measures be taken to resolve the issue of human-bear conflict.

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Environment, 2001), [http://www.srd.gov.ab.ca/fishwildlife/speciesatrisk/pdf/SAR\\_10.pdf](http://www.srd.gov.ab.ca/fishwildlife/speciesatrisk/pdf/SAR_10.pdf) (accessed December 18, 2007); Idaho's Yellowstone Grizzly Bear Delisting Advisory Team, *Yellowstone Grizzly Bear Management Plan to Accompany HCR 62* (Boise: State of Idaho, 2002), [http://species.idaho.gov/pdf/grizzly\\_plan.pdf](http://species.idaho.gov/pdf/grizzly_plan.pdf) (accessed December 18, 2007); Minette Johnson, *Places for Grizzly Bears: A Blueprint for Restoration and Recovery in the Lower 48 States* (Washington, D.C.: Defenders of Wildlife, 2006), [http://www.defenders.org/resources/publications/programs\\_and\\_policy/wildlife\\_conservation/imperiled\\_species/grizzly/a\\_place\\_for\\_grizzlies.pdf](http://www.defenders.org/resources/publications/programs_and_policy/wildlife_conservation/imperiled_species/grizzly/a_place_for_grizzlies.pdf) (accessed December 18, 2007); Ministry of Environment, Lands, and Parks, *Bear-Human Conflict Reduction Guidelines for River Rafting* (Victoria: Government of British Columbia, 1998), [http://www.env.gov.bc.ca/wld/documents/bear\\_human\\_conflict.pdf](http://www.env.gov.bc.ca/wld/documents/bear_human_conflict.pdf) (accessed December 18, 2007); David S. Moody, Dennie Hammer, Mark Bruscino, Dan Bjornlie, Ron Grogan, and Brian Debolt, *Wyoming Grizzly Bear Management Plan* (Cheyenne: Wyoming Fish and Game Department, 2002), <http://www.fs.fed.us/r1/wildlife/igbc/ConservationStrategy/wyomingplan.pdf> (accessed December 18, 2007); Seth M. Wilson, Michael J. Madel, David J. Mattson, Jonathan M. Graham, and Troy Merrill, "Landscape Conditions Predisposing Grizzly Bears to Conflicts on Private Agricultural Lands in the Western USA," *Biological Conservation* 130 (2006): 47-59.

<sup>22</sup> George B. Schaller, Zhi Lu, Hao Wang, and Tie Su, "Wildlife and Nomads in the Eastern Chang Tang Reserve, Tibet," in *Wildlife and Plants in Traditional and Modern Tibet: Conceptions, Exploitation, and Conversation*, ed. A. Boesi and F. Cardi, *Memorie della Societa Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano* 33, Fascicolo 1 (Milano: Memorie della Societa Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano, 2005), 59-67; Fox and Tsering, "Biodiversity Conservation and Natural Resource Exploitation on Tibet's Northwest Chang Tang Highlands."

## Glossary

**Note:** these glossary entries are organized in Tibetan alphabetical order. All entries list the following information in this order: THL Extended Wylie transliteration of the term, THL Phonetic rendering of the term, the English translation, the Sanskrit equivalent, the Chinese equivalent, other equivalents such as Mongolian or Latin, associated dates, and the type of term.

Ka					
Wylie	Phonetics	English	Other	Dates	Type
<i>krung go</i>	Trunggo	China	Chi. <i>Zhongguo</i>		Place
Kha					
Wylie	Phonetics	English	Other	Dates	Type
<i>khe na ta</i>	Khenata	Canada	Chi. <i>Jianada</i>		Place
Ga					
Wylie	Phonetics	English	Other	Dates	Type
<i>gro nyi</i>	Dronyi		Chi. <i>Zhuoni</i>		Place
<i>gro nyi grong brdal</i>	Dronyi Drongdel	Dronyi Township	Chi. <i>Zhuoni Zhen</i>		Place
<i>grong brdal</i>	drongdel	township	Chi. <i>zhen</i>		Term
<i>dge rgyas</i>	Gegyé		Chi. <i>Geji</i>		Place
<i>dge rgyas rdzong</i>	Gegyé Dzong	Gegyé County	Chi. <i>Geji xian</i>		Place
<i>dge rtse</i>	Getsé		Chi. <i>Gaize</i>		Place
<i>dge rtse rdzong</i>	Getsé Dzong	Getsé County	Chi. <i>Gaize xian</i>		Place
<i>'gro ba</i>	Drowa		Chi. <i>Zhuowa</i>		Place
<i>'gro ba grong brdal</i>	Drowa Drongdel	Drowa Township	Chi. <i>Zhuowa Zhen</i>		Place
Nga					
Wylie	Phonetics	English	Other	Dates	Type
<i>ngul chu</i>	Ngülchu		Chi. <i>Ejiu</i>		Place
<i>ngul chu grong brdal</i>	Ngülchu Drongdel	Ngülchu Township	Chi. <i>Ejiu Zhen</i>		Place
<i>mnaga' ris sa gnas</i>	Ngari Sané	Ngari Prefecture	Chi. <i>Ali Diqu</i>		Place
Ca					
Wylie	Phonetics	English	Other	Dates	Type
<i>cun tshang</i>	Chüntsang		Chi. <i>Juncang</i>		Place
<i>cun tshang grong brdal</i>	Chüntsang Drongdel	Chüntsang Township	Chi. <i>Juncang Zhen</i>		Place
<i>lcags sgo</i>	Chakgo		Chi. <i>Jiagu</i>		Place
<i>lcags sgo grong brdal</i>	Chakgo Drongdel	Chakgo Township	Chi. <i>Jiagu Zhen</i>		Place
<i>lci ba</i>	Chiwa		Chi. <i>Jiwa</i>		Place
<i>lci ba grong brdal</i>	Chiwa Drongdel	Chiwa Township	Chi. <i>Jiwa Zhen</i>		Place
Nya					
Wylie	Phonetics	English	Other	Dates	Type
<i>nyi ma</i>	Nyima		Chi. <i>Nima</i>		Place
<i>nyi ma grong brdal</i>	Nyima Drongdel	Nyima Township	Chi. <i>Nima Zhen</i>		Place
<i>nyi ma brdal</i>	Nyima Del	Nyima Township	Chi. <i>Nima Zhen</i>		Place



<i>nyi ma rdzong</i>	Nyima Dzong	Nyima County	Chi. <i>Nima Xian</i>		Place
<i>nyima rdzong nags las spyi bde cus</i>	Nyima Dzong Naklé Chidechü	Nyima County Forestry Bureau	Chi. <i>Nima xian linye gongan ju</i>		Organization
<b>Ta</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>rta mgo</i>	Tamgo		Chi. <i>Daguo</i>		Place
<i>rta mgo grong brdal</i>	Tamgo Drongdel	Tamgo Township	Chi. <i>Daguo Zhen</i>		Place
<b>Na</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>nag chu sa gnas</i>	Nakchu Sané	Nakchu Prefecture	Chi. <i>Naqu Diqu</i>		Place
<b>Ba</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>bag tshwa grong brdal</i>	Baktsa Drongdel	Baktsa Township	Chi. <i>Bazha zhen</i>		Place
<i>bar gling grong brdal</i>	Barling Drongdel	Barling Township	Chi. <i>Balin zhen</i>		Place
<i>bod</i>	Bö	Tibet	Chi. <i>Xizang</i>		Place
<i>bod pa'i rig gnas khyab khongs</i>	Böpé Rikné Khyapkhong	Tibetan cultural area	Chi. <i>Zangzu wenhua quyü</i>		Geographic feature
<i>bod rang skyongs ljongs</i>	Bö Rangkyong Jong	Tibet Autonomous Region (TAR)	Chi. <i>Xizang Zizhi Qu</i>		Place
<i>byang thang</i>	Jangtang		Chi. <i>Qiangtang</i>		Geographic feature
<i>byang thang rgyal khab rim pa'i rang byung srung skyob khul</i>	Jangtang Gyelkhap Rimpé Rangjung Sungkyop Khül	Jangtang National Nature Reserve	Chi. <i>Qiangtang Ziran Baohu Qu</i>		Place
<i>'brong tshang</i>	Drongtsang		Chi. <i>Zhongcang</i>		Place
<i>'brong tshang grong brdal</i>	Drongtsang Drongdel	Drongtsang Township	Chi. <i>Zhongcang Zhen</i>		Place
<b>Ma</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>ma yor grong brdal</i>	Mayor Drongdel	Mayor Township	Chi. <i>Mayue zhen</i>		Place
<i>smad pa grong brdal</i>	Mepa Drongdel	Mepa Township	Chi. <i>Maiba Zhen</i>		Place
<b>Tsha</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>mtsho sngon zhing chen</i>	Tsongön Zhingchen	Qinghai Province	Chi. <i>Qinghai Sheng</i>		Place
<i>mtsho gnyis</i>	Tsonyi		Chi. <i>Shuanghu</i>		Place
<i>mtsho gnyis rdzong</i>	Tsonyi Dzong	Tsonyi County	Chi. <i>Shuanghu Xian</i>		Place
<i>mtsho bod sa mtho</i>	Tsobö Sato	Tibetan Plateau	Chi. <i>Qingzang Gaoyuan</i>		Geographic feature
<i>mtsho lho grong brdal</i>	Tsolho Drongdel	Tsolho Township	Chi. <i>Cuoluo Zhen</i>		Place
<b>Dza</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>'dzam gling khor yug thebs rtsa</i>	Dzamling Khoryuk Teptsä	WWF	Chi. <i>Shjie ziran jijinhui</i>		Organization

'dzam gling khor yug thebs rsta tshogs pa'i lha sa nram grangs gzhung don khang	Dzamling Khoryuk Teptsu Tsokpé Lhasa Namdrang Zhungdönkhang	WWF China-Lhasa Field Office	Chi. <i>Shjie ziran jijinhui zhongguo- lasa tianye xiangmu ban</i>		Organization
<b>Zha</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>zhi bde grong brdal</i>	Zhidé Drongdel	Zhidé Township	Chi. <i>Xiede Zhen</i>		Place
<b>Za</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>zi ling</i>	Ziling		Chi. <i>Selin</i>		Place
<i>zi ling mtsho</i>	Ziling Tso	Ziling Lake	Chi. <i>Selin Hu</i>		Lake
<i>zi ling mtsho rgyal khab rim pa'i rang byung srung skyob khul</i>	Ziling Tso Gyelkhab Rimpé Rangjung Sungkyop Khül	Ziling Lake National Nature Reserve	Chi. <i>Selin Hu Ziran Baohu Qu</i>		Place
<b>a</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>'om phu</i>	Ompu		Chi. <i>Wenbu</i>		Place
<i>'om phu grong brdal</i>	Ompu Drongdel	Ompu Township	Chi. <i>Wenbu Zhen</i>		Place
<b>Ra</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>ru thog</i>	Rutok		Chi. <i>Ritu</i>		Place
<i>ru thog rdzong</i>	Rutok Dzong	Rutok County	Chi. <i>Ritu xian</i>		Place
<i>rong ma</i>	Rongma		Chi. <i>Rungma</i>		Place
<i>rong ma grong brdal</i>	Rongma Drongdel	Rongma Township	Chi. <i>Rungma Zhen</i>		Place
<b>La</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>legs mdog</i>	Lekdok		Chi. <i>Laiduo</i>		Place
<i>legs mdog grong brdal</i>	Lekdok Drongdel	Lekdok Township	Chi. <i>Laiduo Zhen</i>		Place
<b>Sha</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>shen tshwa</i>	Shentsa		Chi. <i>Shenzha</i>		Place
<i>shen tshwa grong brdal</i>	Shentsa Drongdel	Shentsa Township	Chi. <i>Shenzha Zhen</i>		Place
<i>shen tshwa rdzong</i>	Shentsa Dzong	Shentsa County	Chi. <i>Shenzha Xian</i>		Place
<i>shen tshwa rdzong nags las spyi bde cus</i>	Shentsa Dzong Naklé Chidechü	Shentsa County Forest Police Office	Chi. <i>Shenzha xian linyè gongan ju</i>		Organization
<i>srin ya</i>	Sinya		Chi. <i>Shenya</i>		Place
<i>srin ya grong brdal</i>	Sinya Drongdel	Sinya Township	Chi. <i>Shenya Zhen</i>		Place
<b>Ha</b>					
<b>Wylie</b>	<b>Phonetics</b>	<b>English</b>	<b>Other</b>	<b>Dates</b>	<b>Type</b>
<i>he ma la ya</i>	Hemalaya	Himalaya	Chi. <i>Ximalaya</i>		Geographic feature
<i>lha sa</i>	Lhasa		Chi. <i>Lasa</i>		Place

A					
Wylie	Phonetics	English	Other	Dates	Type
<i>a mdo</i>	Amdo		Chi. <i>Anduo</i>		Place
<i>a mdo rdzong</i>	Amdo Dzong	Amdo County	Chi. <i>Anduo Xian</i>		Place
<i>a me ri kha</i>	Amerikha	United States	Chi. <i>Meiguo</i>		Place
<i>a zur</i>	Azur		Chi. <i>Asuo</i>		Place
<i>a zur grong brdal</i>	Azur Drongdel	Azur Township	Chi. <i>Asuo Zhen</i>		Place
<i>a la si ka</i>	Alasika	Alaska	Chi. <i>Ala sijia</i>		Place
<i>ari</i>	Ari	United States	Chi. <i>Meiguo</i>		Place

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